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EDITORIAL.

EDITORS, E. D. COPE AND J. S. KINGSLEY.

SOME interesting expressions of opinion as to the essential nature of organic evolution have been recently published in England. We refer to the addresses before the physiological and biological sections of the British Association for the Advancement of Sciences, by Dr. Burdon Sanderson and Sir William Turner; to the book "Darwinism," by Alfred Russel Wallace; and to the review of the latter by Prof. E. Ray Lankester, which has just appeared in *Nature*.

Dr. Burdon Sanderson distinguishes the functions of living beings into two divisions, growth and metabolism, which are the subject matter of two sciences, morphology and physiology. Evolution results from modification of growth, and as growth is really metabolism under some directive influence, it is interesting to note the aspect the subject presents to this able physiologist as expressed in the closing remarks of his address: "The word life is used in physiology in what, if you like, may be called a technical sense, and denotes only that state of change with permanence which I have endeavored to set forth to you. In this restricted sense of the word, therefore, the question, What is life? is one to which the answer is approachable, but I need not say that in a higher sense—higher because it appeals to higher faculties in our nature—the word suggests something outside of mechanism, which may perchance be its cause rather than its effect."

Sir William Turner says: "To reject the influence which use and disuse of parts may exercise both on the individual and on his offspring, is like looking at an object with only a single eye. All biologists will, I suppose, accept the proposition that the individual soma is influenced or modified by its environment. Now, if on the basis of this proposition the theory be grafted that modifications or variations thus produced are capable of so affecting the germplasm of the individual in whom the variation arises as to be transmitted to its offspring—and I have already given cases in point—then such variations might be perpetuated. If the modi-

fication is of service, then presumably it will add to the viability of the individual, and through the interaction of the soma and the germplasm, in connection with their respective nutritive changes, will so affect the latter as to lead to its being transmitted to the offspring. From this point of view the environment would, as it were, determine and regulate the nature of those variations which are to become hereditary, and the possibility of variations arising which are likely to prove useful becomes greater than on the theory that the soma exercises no influence on the germplasm. Hence I am unable to accept the proposition that somatogenic characters are not transmitted, and I cannot but think that they form an important factor in the production of hereditary characters."

These are the views of two of England's most distinguished biologists, and we find them to be in strong contrast to those expressed by Dr. Wallace and Prof. Lankester, no less able men in their respective fields. Dr. Wallace does not yet see beyond natural selection, and well illustrates the peculiar blindness to the nature of the origin of variations which is prevalent in quarters which hold to what they consider to be pure Darwinism, but which has been better termed "post-Darwinism." But as an illustration of how difficult it is to keep one's eyes from twisting to the right, Dr. Wallace does actually endeavor to explain the origin of the rotated eye of the flat-fish by appealing to the inheritance of an acquired character, which is ever increased by the transmission of additional acquisition. This is, as wittily remarked by Lankester, "flat Lamarckism." And Lankester has slipped into rationality in the same way, in attributing the asymmetry of the Gastropod Mollusca "to the cumulative effect of a mechanical cause." Both these gentlemen thus inadvertently abandon the major premise of the post-Darwinians—that acquired characters cannot be inherited. Prof. Weismann and others endeavor to sustain this position by experimenting on the inheritance of mutilation, as though it were not already sufficiently well known that broken heads and legs are not inherited! The evidence of palæontology ought to be of some value as to what is and what is not inherited, but this has not yet come fairly into the hands of

either Dr. Wallace or Dr. Lankester. "The American evolutionists" will soon furnish them with some additional information on this topic, all quite as much within the "scientific method" as are the speculations of Weismann, though Dr. Wallace and Prof. Lankester think that they have not done so in the past. According to the latter, the opponents of post-Darwinism are not "laboratory men," which explains their shortcomings. But there are laboratories and laboratories! The laboratories where section cutting and staining form the methods of studying nature are of high importance, but they do not cover the whole ground. Indeed, the adepts at this work are sometimes grossly ignorant of gross anatomy. In the estimation of some of these gentlemen the value of a scientific pursuit is inversely as the size of the objects studied. What the value of cetology can be in such eyes we do not know, unless it be something to be promptly sat upon.

—THE recent establishment of four geological surveys in as many States of the South, is a matter of congratulation. The first to lead the way was Arkansas, whose survey is in active prosecution by Prof. Branner. The Texas Legislature next inaugurated the work, and appointed Prof. Dumbel to superintend it. Prof. Dumbel has displayed much energy in getting his organization to work, and much is to be expected from his corps of able assistants. In the present number of the *NATURALIST* we announce the opening of the surveys of Missouri by Prof. Winslow, and of Georgia under Prof. J. W. Spencer. The people of the South were never more alive to the importance of developing the resources of their States, and of contributing their share to the stock of our knowledge of creation in all its aspects.